0702

R-585-1-4-21
SITE INSPECTION OF
ALLIED CHEMICAL - BALTIMORE WORKS
PREPARED UNDER

TDD NO. F3-8305-52
EPA NO. MD-13
CONTRACT NO. 68-01-6699

FOR THE

HAZARDOUS SITE CONTROL DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

APRIL 17, 1985

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY	REVIEWED BY	APPROVED BY
Donald J. Messinger	William Wentworth	
DONALD J. MESSINGER	WILLIAM WENTWORTH	GARTH GLENN
GEOLOGIST	ASSISTANT MANAGER	MANAGER, FIT III

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SECTION 1

1.0 INTRODUCTION

1.1 Authorization

NUS Corporation performed this work under Environmental Protection Agency Contract No. 68-01-6699. This specific report was prepared in accordance with Technical Directive Document No. F3-8305-52 for Allied Chemical - Baltimore Works located on Block and Wills Streets, in Baltimore, Maryland.

1.2 Scope of Work

NUS FIT III was tasked to conduct a low priority site inspection/sampling/HRS (if necessary) of the subject disposal area in conjunction with state authorities. Herein are the results and conditions pursuant to that investigation.

1.3 Summary

The Allied Chemical - Baltimore Works site is located at the chemical processing and manufacturing facility owned and operated by Allied Chemical Corporation. Historical data and Allied officials indicate that portions of the facility and surrounding properties consist of chromite ore tailings containing hexavalent chromium, a toxic heavy metal. The most recent and well documented landfilling of chromite ore involved approximately 6,800 tons of tailings disposed of in an on-site slip in 1955.

Direct contact of wastes with subsurface waters underlying the facility has resulted in documented contamination of these subsurface waters and of adjacent Baltimore Harbor water and sediments.

A total of 6 low concentration aqueous and sediment samples were collected by FIT III including samples of the slip and the facility's non-contact cooling water system.

Analytical results of these samples showed substantially elevated levels of chromium. Other compounds of less concern include lead and PCB.

The results of the analysis of the samples collected by FIT III are summarized in section 6, and a toxicological evaluation of their impact on human health and the environment is presented in section 7.0.

SECTION 2

2.0 THE SITE

2.1 Location

The facility is located on Block and Wills Streets on the northern shore of the Northwest Branch of Baltimore Harbor, less than 1 mile southwest of Patterson Park. The former on-site slip disposal area is located 400 to 450 feet east of the southwest corner of the plant (see figure 2, appendix B), southwest of the waste storage buildings.

2.2 Site Layout

As described in section 2.1, the former slip, listed by the Eckhardt Report as having received 6,800 tons of chromite ore tailings, is located in the southwest quadrant of the facility.

The slip site is defined on the east and west by bulkhead. The surface of the fill is covered with asphalt, with the exception of the southern face where fill is exposed and is in direct contact with the harbor. In addition to the tailings in the old slip, it should be noted that various sources indicate that of the approximately 20 acres owned by Allied, 7 or 8 acres of the facility probably consist of chromite ore tailings, which, over the past 135 years, were extensively used as harbor fill materials.

2.3 Ownership History

Chromium chemicals have been manufactured on the facility property since approximately 1848. In 1890, Mutual Chemical of America bought the plant and in 1952 built the main processing facility used today. Allied Chemical bought the facility in 1954.

2.4 Site Use History

According to the Hazardous Waste Assessment (1982) by JRB Associates (JRB No. 02-817-03-513-36), the chromite ore tailings generated at the site over the past 135 years (see section 2.3) have been used to reclaim large portions of the Baltimore Harbor, including portions of the present Allied plant. Allied personnel, however, had no knowledge of specific dumping areas prior to the 1930s. Allied personnel stated that, from at least the 1930s to 1975, tailings were dumped at the present site of the Dundalk Marine Terminal. Within recent history (1955), Allied Chemical reported that 6,800 tons of tailings were dumped to fill in an old slip which divided sections of the Block and Wills Street plant. No further episodes of on-site dumping occurred.

2.5 Permit and Regulatory Action History

The Allied facility currently holds the necessary Federal and State permits, including CHS Storage and NPDES permits, and is notified as a RCRA hazardous waste generator. The only violations recorded to date have been for elevated NPDES chromium levels.

2.6 Remedial Action To Date

There has been no remedial action to date concerning this site.

SECTION 3

3.0 ENVIRONMENTAL SETTING

3.1 Water Supply

Water for Allied Chemical's non-contact cooling water system is a single surface water intake on Baltimore Harbor. It has been reported by Maryland Department of Health and Mental Hygiene personnel that industries throughout the Baltimore area draw on groundwater for cooling water. Information as to specific facilities or yielding aquiferous units for the Allied area, however, is not available.

Drinking water supplies for Allied Chemical and surrounding properties are provided by the Baltimore Municipal supply, the source of which is 2 reservoir surface impoundments located over 30 miles northwest of the city.

3.2 Surface Waters

The surface of the Allied facility is almost completely covered by asphalt, concrete, or buildings. Surface drainage flows toward the harbor under direct runoff. Although located along the harbor, the flood hazard potential is low. According to plant officials, the site has never been flooded.

3.3 Geology and Soils

No site-specific subsurface data (i.e., monitoring/production well logs) are currently available for the subject site. According to the JRB Assessment Final Report, the Allied Chemical facility is underlain by a small section of the Upper Cretaceous Arundel Formation. This unit consists of an undeterminable thickness of gray, brown, black, and red kaolinitic and illitic clays interbedded with quartz sand and silt. The clays overlie Lower Cretaceous age Patuxent sands and gravels. Depth to bedrock under the site is reported by JRB to be between 80 and 100 feet.

Surficially, the site is bounded on 3 sides by artificial fill material of unknown depth.

3.4 Groundwaters

As previously discussed in section 3.1, subsurface water beneath the Allied facility is in direct contact with both artificial fill/chromite ore tailings and the waters of Baltimore's Northwest Harbor. The depth of the water table in this instance will be a function of both upgradient recharge and tidal influences, with shallow groundwater movement expected to be toward the harbor.

The main aquiferous unit of concern in the area is the Patuxent Formation; however, there is insufficient data available to define this unit's current use, quality, or the potential interrelationship between the unit and contaminant problems on the site.

3.5 Climate And Meteorology

Baltimore County has a continental type climate with 4 well-defined seasons modified by the Chesapeake Bay. Annual precipitation for the Baltimore City area is 43.05 inches. Approximately 10 inches of this are net. Precipitation is fairly uniform throughout the year. Prevailing winds are west-northwest to northwest, except during May through September when they become southerly.

3.6 Land Use

The area immediately surrounding the Allied site consists of small to medium sized manufacturing facilities and a lumber yard. Within a 1-mile radius of the site lies major areas of downtown Baltimore including City Hall, libraries, schools, and playgrounds. Land use is, therefore, both commercial and residential.

3.7 Population Distribution

Population estimates within 1/4-, 1/2-, and 3/4-mile radius of the site are less than 500, 1,000 to 3,000, and 5,000 to 10,000, respectively.

3.8 Critical Environments

The Allied facility is located along the north shore of Baltimore's Northwest Harbor, an arm of the Patapsco River which enters the Chesapeake Bay approximately 10 to 15 miles downstream. The Chesapeake is the largest estuary system in the U.S. and one of the most productive worldwide. The estuary is a critical environment for many species. The issue of whether the Allied facility is contributing to the degradation of the bay cannot be determined from available information. EPA suspects that chromium can migrate for great distances downstream with little or no sediment accumulation.

SECTION 4

4.0 WASTE TYPES AND QUANTITIES

In responding to the Eckhardt Survey, Allied listed 6,800 tons of chromite ore tailings as being disposed of on site. The tailings contained various concentrations of Cr^{+3} and Cr^{+6}, as well as Fe, Mn, Mg, Zn, Cu, and Cd. Of the 2 chromium oxidation states, Cr^{+6} is significantly more toxic than Cr^{+3}. In addition, Cr^{+6} is a known potent carcinogen. The oxides and salts of Cr^{+6} are very soluble in water as opposed to those of Cr^{+3}.

Unknown quantities of chromite ore tailings have been used as artificial fill throughout the Baltimore Harbor area.

SECTION 5

5.0 FIELD TRIP REPORT

5.1 Summary

On December 16, 1983, Donald Messinger and Arthur Weber of NUS FIT III conducted a site investigation/sampling of the Allied Chemical Corporation - Baltimore Works Plant on Block and Wills Street, Baltimore, Maryland. Permission for access and to sample and take photographs was given by Joseph Lewendowski, Allied's Manager of Environmental Affairs, in a telephone conversation with Donald Messinger on December 6, 1983. A total of 2 on-site sediment samples and 4 aqueous samples were collected at the time of the investigation.

Weather conditions the day of the inspection were sunny and cool (approximately 40°). Heavy rains occurred earlier in the week.

5.2 Persons Contacted

5.2.1 Prior to Field Trip

David Healy
Bernie Demkowski
MD HMH
201 West Preston Street
Baltimore, MD 20201
(301) 383-6650

Joe Lewendowski
Manager of Environmental Affairs
Allied Chemical Corporation
1348 Block Street
Baltimore, MD 21231
(301) 522-5200

5.2.2 At The Site

Joe Lewendowski
Manager of Environ. Affairs
Mark Sylvester
Environmental Engineer
Allied Chemical Corporation
1348 Block Street
Baltimore, MD 21231
(301) 522-5200

David Healy
Bernie Demkowski
MD HMH
201 West Preston Street
Baltimore, MD 20201
(301) 383-6650

TDD Number F3-8305-52
EPA Number MO-13

5.3 SAMPLE LOG

Site Name ALLIED CHEM- BALT. WKS

TRAFFIC REPORTS Organic	TRAFFIC REPORTS Inorganic	TRAFFIC REPORTS High Hazard	SAMPLING LOCATION	PHASE	SAMPLE DESCRIPTION	DATE	TIME	pH	COMMENTS/OBSERVATIONS	LABORATORY
2297-1	MC2132		ALLIED SLIP	AQ/LO	Chrome yellow water odorless	12/16/83	1115	7.4		INORG - CHEMTECH
2297-2	MC2133		ALLIED SLIP	SOL/LO	Coarse, yellow/orange brn sediments/some clay		1120			
2297-3	MC2134		ALLIED SLIP EMBANKMENT	SOL/LO	same as above		1125			ORG. TO W. MICH ENV. SERV.
2297-4	MC2135		ALLIED INTAKE	AQ/LO	Slight yellow color odorless		1145	7.7		
2297-5	MC2172		OUTFALL 002	AQ/LO	same as above		1200	8.0		
2297-6	MC2173		OUTFALL 001	AQ/LO	same as above		1210	7.9		
2297-7	MC2174		BLANK	AQ/LO	—		1300			
2297-8	MC2175		BLANK	SOL/LO	—		1310			

5.4 Site Observations

- Access to the site is controlled by a guardhouse.
- All sections of the facility are covered with asphalt or concrete.
- Some of the chromite ore tailings are stored in a large building northeast of the slip area. The material is piled on the cement floor.
- There was no evidence of spills or releases found on the property except for some yellow staining and liquid collected in a cement sump area immediately north of the slip fill area.
- The southern face of the slip area, which is open to the harbor, had a gravel surface. Bluffs of multicolored, granular material, similar to the tailings in the waste storage building, were quite visible during the low tide period of the investigation.
- Water in the slip area had a yellow cast.
- Subaqueous sediments beneath the gravelly surface materials of the slip were yellow, white, and black with a granular texture similar to the material exposed in the bluff.
- Aqueous samples of the north outfall (001) had a slight yellowish tint.
- Except for the southern face of the slip fill area, the facility is separated from the harbor by bulkhead.

5.5 PHOTOGRAPH LOG

Photo 1 - Arthur Weber sampling slip water.

Photo 2 - Donald Messinger sampling Allied slip.

Photo 3 - Arthur Weber samples slip embankment.

Photo 4 - Arthur Weber sampling Allied intake.

Photo 5 - Arthur Weber and Mark Sylvester taking Outfall 002 sample.

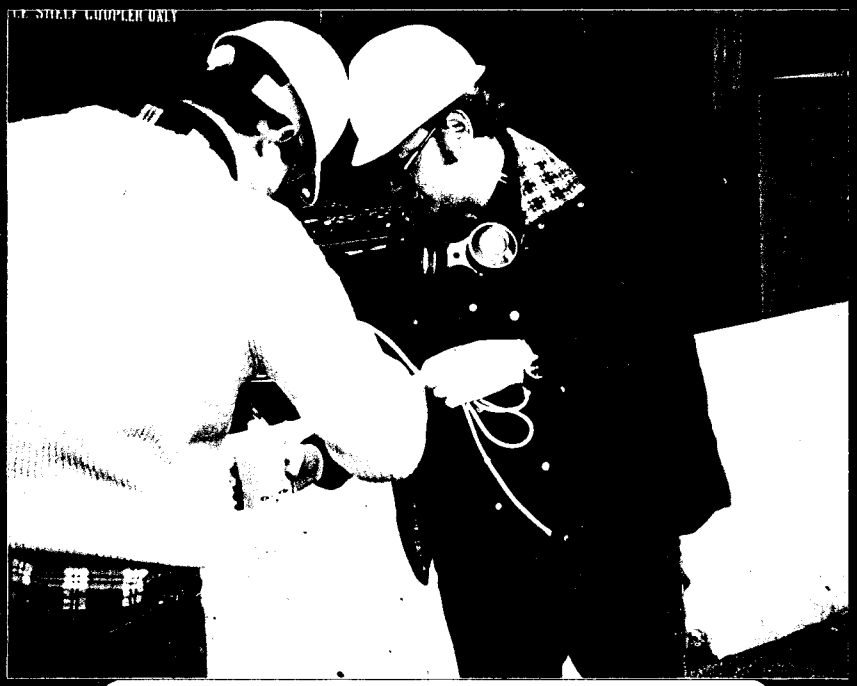

Photo 6 - Donald Messinger and Arthur Weber sample Outfall 001.

TDD No. F3-8305-52

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	13

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Allied Chemical - Baltimore Works	1348 Block and Wills Streets				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG. DIST.**
Baltimore	MD	21231	Baltimore		

09 COORDINATES
LATITUDE: 39° 16' 09" _ _ . _ | LONGITUDE: 76° 35' 56" _ _ . _

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
12 / 16 / 83 (MONTH DAY YEAR)	☒ ACTIVE ☐ INACTIVE	1848 (BEGINNING YEAR) present (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☒ B. EPA CONTRACTOR NUS Corporation (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO
Donald Messinger	Geologist	NUS Corp.	(215) 687-9510
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO**
Arthur Weber	Environmental Scientist	NUS Corp.	(215) 687-9510
David Healy	State Coordinator	MD HMH	(301) 383-6650
Bernie Demkowski	Field Inspector	MD HMH	(301) 383-6650
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Joe Lewendowski	Manager of Environ. Affairs	1348 Block Street	(301) 522-5200
Mark Sylvester	Environ. Engineer	Baltimore, Maryland	(301) 522-5200
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	9 AM to 1:40 PM	sunny and cool with a temperature of 40°F

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Donald Messinger	NUS Corporation, FIT III	(215) 687-9510

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Donald Messinger	NUS Corp.	FIT III	215 687-9510	12 / 30 / 83 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MD	13

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 10,000 — 04 NARRATIVE DESCRIPTION

Unknown but probable as subsurface waters beneath the site which recharge the harbor are in direct contact with waste analyzed to contain water soluable hexavalent chromium.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 12/26/83) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: <25,000 — 04 NARRATIVE DESCRIPTION

Sample results of FIT III site inspection (12/16/83) indicate contamination of surface water.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No air monitoring was performed.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None reported or observed

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Wastes in slip are exposed during low tide but potential for direct contact is low.

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: N/A (Acres) — 04 NARRATIVE DESCRIPTION

Not applicable. Chromite wastes were disposed of on harbor sediments.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: N/A — 04 NARRATIVE DESCRIPTION

Not applicable. Baltimore is served by surface water impoundments.

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Unknown but potential exists as chromite ore and wastes are processed and temporarily stored on site and exposed in the slip.

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The widespread use of chromite wastes as fill in the Baltimore Harbor area make this a regional problem of which the wastes in the slip are but a small part.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	13

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☒ A. NPDES	81DP0038			
☐ B. UIC				
☐ C. AIR				
☒ D. RCRA	MD009396711			
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☒ G. STATE (Specify) CHS Storage	A244			
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER (Specify) filled slip	6,800	tons

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify) None

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

<0.1 (Acres)
slip area is
155 feet by 175 feet

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Wastes dumped into ship slip. Bulkheads on 3 of 4 sides, open to Baltimore Harbor.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

State files and FIT III site inspection

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	13

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one) unknown

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one) N/A

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
80 to 100 (ft)	unknown (ft)	unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
10 (in)	2.5 to 3 (in)	<1 %	toward harbor	<1 %

09 FLOOD POTENTIAL

SITE IS IN 100 YEAR FLOODPLAIN

10 N/A

☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. 10 to 15 (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

N/A _____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. 0 (mi)	B. N/A (mi)	C. N/A (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The Allied Chemical plant and surrounding properties are built on reclaimed lands from Baltimore Harbor. The surrounding topography is flat as is the site itself.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State and EPA files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MD	13

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Allied Chemical Corportion		1348 Block Street	2819	Baltimore	MD	21231
N/A						
N/A						
N/A						

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
N/A						
N/A						
N/A						
N/A						

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Mutual Chemical of America		N/A				
N/A						
N/A						

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
N/A						
N/A						
N/A						

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State files and FIT III site inspection

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MD	13

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
Allied Chemical Corporation	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1348 Block Street	2819

05 CITY	06 STATE	07 ZIP CODE
Baltimore	MD	21231

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
N/A		N/A	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
N/A		N/A	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
N/A		N/A	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MD	13

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

State and EPA files

SECTION 6

6.0 LABORATORY DATA

6.1 Sample Data Summary

TDD Number F3-8505-52
EPA Number MD-13

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☒ Organic ☐ Inorganic

Site Name ALLIED CHEMICAL
Date of Sample 12-16-83

Solid sample results reported as wet weight.

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: chloroform	methylene chloride	tetrachloro-ethylene	1,1,2,2-tetra-chloroethane	toluene	4-chloro-3-methylphenol	4-chlorophenyl phenyl ether	2,4-dinitro-toluene	n-nitrosodi-phenylamine	diethyl phthalate	di-n-butyl phthalate	bis(2-ethylhexyl) phthalate	acenaphthene	Remarks
2297-1	ALLIED SLIP	AQ/LO	ug/L						2.8				5.6	1.3	3.0		
2297-2	ALLIED SLIP	SOL/LO	mg/kg		.0035	.0023		.0036		0.27	0.27		0.31		0.22	0.16	
2297 3	ALLIED SLIP EMBANKMENT	SOL/LO	mg/kg		.0035							0.05	0.17				
2297 4	ALLIED INTAKE	AQ/LO	ug/L										2.8		1.6		
2297 5	OUTFALL 002	AQ/LO	ug/L		1.5								3.2		5.6		
2297 6	OUTFALL 001	AQ/LO	ug/L	1.4	1.4								4.8		3.1		
2297 7	BLANK	AQ/LO	ug/L	1.1	4.6								4.1		1.4		
2297 8	BLANK	SOL/LO	mg/kg		.0079		.0011						0.13	0.03	0.03		

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

TDD Number F3-8305-52
EPA Number MD-13

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☒ Organic ☐ Inorganic

Site Name ALLIED CHEMICAL
Date of Sample 12-16-83

Solid sample results reported as wet weight.

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: 4,4'-DDE	PCB-1248	PCB-1260	di-n-octyl phthalate										Remarks
22971	ALLIED SLIP	AQ/LO	ug/L				1.3 U										
22972	ALLIED SLIP	SOL/LO	mg/kg	0.014 J	0.16	0.32											
22973	ALLIED SLIP EMBANKMENT	SOL/LO	mg/kg	0.0003 J		0.02	0.12 U										
22974	ALLIED INTAKE	AQ/LO	ug/L														
22975	OUTFALL 002	AQ/LO	ug/L														
22976	OUTFALL 001	AQ/LO	ug/L														
22977	BLANK	AQ/LO	ug/L														
22978	BLANK	SOL/LO	mg/kg														

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

TDD Number F3-8305-52
EPA Number MD-13

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name ALLIED CHEMICAL
Date of Sample

Sample Number MC	Sample Description and Location	Phase	Units	Compounds Detected: Aluminum	Chromium	Barium	Beryllium	Cobalt	Copper	Iron	Nickel	Manganese	Zinc	Boron	Vanadium	Silver	Remarks
MC 2132	ALLIED SLIP	AQ/LO	ug/L	2250	2476					4087		105	37	317			
MC 2133	ALLIED SLIP	SOL/LO	mg/kg	7570	2960	10.7	1.2	22	10.5	16390	74	208	75	15.6	185		
MC 2134	ALLIED SLIP EMBANKMENT	SOL/LO	mg/kg	19700	3230	15.0	5.2	87	6.3	53,000	292	543	189	62	762		
MC 2135	ALLIED INTAKE	AQ/LO	ug/L	177◊	371					301		82		761			
MC 2172	OUTFALL 002	AQ/LO	ug/L	234◊	4.4◊					260		91	11	733			
MC 2173	OUTFALL 001	AQ/LO	ug/L	190◊	530					269		78	13	682			
MC 2174	BLANK	AQ/LO	ug/L														
MC 2175	BLANK	SOL/LO	mg/kg														

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

TDD Number F3-8305-5L
EPA Number MD-13

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name ALLIED CHEMICAL
Date of Sample

Compounds Detected

Sample Number MC	Sample Description and Location	Phase	Units	Arsenic	Cadmium	Lead	Cyanide										Remarks
2132 (MC)	ALLIED SLIP	AQ/LO	ug/l		2.0 ◊	13	10										
MC 2133	ALLIED SLIP	SOL/LO	mg/kg	2.1	0.16 ◊	21	0.95										
MC 2134	ALLIED SLIP EMBANKMENT	SOL/LO	mg/kg	0.90	0.22 ◊	60	0.68										
MC 2135	ALLIED INTAKE	AQ/LO	ug/l				28										
MC 2172	OUTFALL 002	AQ/LO	ug/l			8.3											
MC 2173	OUTFALL 001	AQ/LO	ug/l			8.3											
MC 2174	BLANK	AQ/LO	ug/l														
MC 2175	BLANK	SOL/LO	mg/kg														

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

6.2 Quality Assurance Review

6.2.1 Organic Data: Lab Case 2297

6.2.1.1 Introduction

The findings offered in this report are based upon a general review of all laboratory data generated by a subcontract which performed analyses for organic priority pollutants according to the requirements outlined in NUS Internal Correspondence C-585-11-3-56. Blank analysis results, surrogate and matrix spike recoveries, duplicate analysis results, G.C. confirmations, and target compound matching quality were examined in detail.

6.2.1.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

- All positive results for chloroform, methylene chloride, tetrachloroethylene, 4-chloro-3-methyl phenol, N-nitrosodiphenylamine, diethylphthalate, di-n-butyl phthalate, bis(2-ethylhexyl) phthalate, and di-n-octyl phthalate may be questionable.

- The results for 4-chlorophenyl-phenylether and 2,4-dinitrotoluene in sample 2 may be questionable.

- The result for 4,4'-DDE in samples 2 and 3 may be questionable.

- Detection limits for 4-nitrophenol, 2,4-dinitrophenol, 2,4-methyl-4,6-dinitrophenol, and hexachloropentadiene in samples 2 and 4 may be significantly higher than those reported.

- The detection limit for endrin aldehyde in sample 2 may be slightly higher than that reported.

- Tentatively identified compounds were reported by the laboratory but are not included in this report.

6.2.1.3 Findings

- Chloroform, methylene chloride, tetrachloroethylene, 4-chloro-3-methylphenol, N-nitrosodiphenylamine, diethyl phthalate, di-n-butyl phthalate, bis(2-ethylhexyl) phthalate, and di-n-octyl phthalate were detected in field and/or laboratory blanks at levels sufficient to question the aforementioned sample results.

- 4-chlorophenyl-phenylether and 2,4-dinitrotoluene in sample 2 were questioned due to very poor matching quality to actual target compound spectra.

- Due to lack of confidence in 2 column G.C. confirmations of low levels single peak pesticides, all reported compounds of this class are deemed questionable and are not addressed in this review.

- 4-nitrophenol, 2,4-dinitrophenol, 2,4-methyl-4,6-dinitrophenol, and hexachloropentadiene exhibited zero matrix spike recoveries in samples 2 and 4.

- Endrin aldehyde exhibited a very low matrix spike recovery in sample 2.

- Per EPA request, tentatively identified compounds were examined only for possible target compound identification.

6.2.1.4 Summary

The attached Quality Assurance Review has identified blank contamination, inadequate spectral matching quality and G.C. confirmations as the primary areas of concern. Please see the accompanying Support Documentation Appendix for specifics on this Quality Assurance Review.

Report prepared by Atwood F. Davis Atwood F. Davis Date: May 15, 1984

6.2.2 Inorganic Data: Lab Case 2297

6.2.2.1 Introduction

The findings offered in this report are based on a general review of all available inorganic laboratory data, blank analysis results, matrix spike results, duplicate analysis results and quality assurance documentation.

6.2.2.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statements:

- Aluminum results for samples MC-2135, MC-2172 and MC-2173 may be questionable.
- Cadmium results for samples MC-2132, MC-2133 and MC-2134 may be questionable.
- The chromium result for sample MC-2172 may be questionable.
- The average concentration for lead in sample MC-2133 may vary slightly from the reported value.

6.2.2.3 Findings

- Aluminum, cadmium and chromium were detected in field and/or laboratory blanks at levels sufficient to question the aforementioned sample results.
- The duplicate analysis for lead in sample MC-2133 exhibited a high variability in results which was probably due to solid sample inhomogeniety.

6.2.2.3 Summary

The attached Quality Assurance Review has identified blank contamination and poor duplicate analysis results as the major areas of concern. Please see the accompanying Suppport Documentation Appendix for specifics on this Quality Assurance Review.

Report prepared by Atwood F. Davis Atwood F. Davis Date: May 15, 1984

SECTION 7

7.0 TOXICOLOGICAL EVALUATION

7.1 Summary

Soil, surface water, intake, and outfall samples from the Allied Chemical site revealed notable concentrations of chromium. Direct contact of chromium containing wastes on this site has resulted in documented contamination of subsurface waters and Baltimore Harbor with chromium. Since the nature of chromium (III or VI) in these samples cannot be determined from available information and since industry traditionally utilizes large amounts of Cr VI, this review primarily addresses the impacts of Cr VI.

Hexavalent chromium compounds can be irritating to nasal passages and skin; and Cr VI is recognized as a human carcinogen via inhalation routes. Note that industrial exposure to high concentrations of chromium is generally required to result in any of these adverse effects. No monitoring for specific compounds that may be present in ambient air on site is available; therefore, the degree of carcinogenic risk (if any) that may result from the inhalation of chromium on the Allied site cannot be assessed from current data.

7.2 Support Data

7.2.1 Scope of Contamination

Notable concentrations of chromium were reported in 5 of 6 aqueous and soil samples taken on the Allied Chemical site. Reported chromium concentrations were 2,460 to 3,230 mg/kg in the slip and slip embankment samples, 2,476 ug/l in the slip aqueous sample, and 530 ug/l in the NPDES outfall 001. The Allied intake from Baltimore Harbor revealed 371 ug/l chromium. All reliably reported chromium levels far exceed those which would normally be expected to occur in nonpolluted background samples.

For example, chromium soil levels typically average about 100 mg/kg.[1] Chromium is normally found only at low levels (average 9.7 ug/l) in natural waters.[2] It has been established that chromite ore tailings containing chromium VI have been disposed of on this site in the past, as recently as 1955. Direct contact of these wastes with subsurface waters has resulted in documented chromium contamination of these subsurface waters and of adjacent Baltimore Harbor water and sediments.

The industrial process at Allied Chemical utilizes chromite ore tailings (containing Cr III) which are roasted, thus converting chromium III to chromium VI. Water is passed through the chromium VI-containing tailings, leaching out some portion of the water soluble chromium VI. Since available chromium results are reported as total chromium, it cannot be determined from available data what concentrations of Cr VI vs. Cr III may still be present in the tailings which were disposed of on site. It is possible that a significant portion of the chromium reported in slip and outfall samples is Cr VI. Since Cr VI represents more of an overall toxic threat to human health, this review will primarily address potential impacts of Cr VI on human health and the environment.

7.2.2 Human Health Impacts

The main health risk involving chromium is in industry where respiratory and epidermal injuries have been caused by Cr VI compounds. Cr III is considered to be less harmful, its main effect being a form of contact dermitis in Cr sensitive individuals.

Inhalation of Cr VI, either as finely powdered chomate or chromic acid mist, can lead to ulceration of the nasal mucosa and perforation of the nasal septum. No ambient air monitoring for chromium compounds on the Allied site is available, and the potential may exist for suspension and subsequent inhalation of chromium containing dusts from piles of ore tailings. CR VI levels in air as low as 0.01 mg/m^3 can produce strong irritation of the nose, even if the exposure is of short duration.[3] Note that the Threshold Limit Value (TLV) for chromium in ambient work place air is 0.05 mg/m^3.

Epidemiological studies of chromate workers also strongly indicate that inhalation of chromium VI is associated with lung cancer and the International Agency for Research on Cancer (IARC) has designated chromium and certain chromium compounds as carcinogenic for humans.[4] However, it should be noted that industrial chromium exposure greatly exceeds that attributable to food, water, and air under normal conditions. For example, an increased incidence of deaths due to lung cancer has been reported in chromate workers exposed to 210 to 1,127,000 ug CrO_3/m^3 in work place air.[5] Non-work place ambient air chromium levels reportedly average 0.015 ug/m^3 (maximum 0.35 ug/m^3), although increased ambient air concentrations of chromium have been reported in the vicinity of industrial sites.[5] Also note that attempts to produce lung cancer in experimental animals by feedings or inhalation exposure to chromium compounds have not been successful.

While documented cases of cancer in humans have only resulted following industrial exposure to relatively high levels of chromium VI in ambient work place air, it must be noted that exposure to far lower levels of hexavalent chromium in ambient air may have some potential for inducing cancer. The degree of risk that may exist for workers or persons otherwise exposed to chromite tailings disposed of on this site cannot be assessed without additional data on ambient air quality in the area. It is important to note that the area immediately surrounding the Allied site is not residential, nor is groundwater beneath the site utilized for potable purposes.

In addition to toxic and potentially carcinogenic effects via inhalation routes, skin exposure to chromium VI may result in corrosive ulceration and contact dermatitis. Compounds of chromium VI permeate the skin fairly readily. While chromium III elicits allergic reactions in chromium-sensitive individuals, the reaction is much less pronounced than for Cr VI because of the slower rate of diffusion of Cr III across the skin.

Ulceration is the most common effect of occupational exposure to Cr VI. These lesions are generally caused by direct contact of a particle of Cr III material or evaporated residue of a concentrated solution of Cr VI with cut or abraded skin. The lesion begins as a painless papule which, if left untreated, forms an ulcer with a raised hard edge. Malignant change never occurs as a result of chronic ulceration.

Chromium induced dermitis may be due to a direct irritant effect or to an allergic reaction at points of chromium contact with skin. Chromium hypersensitivity may be established by patch tests with chromium concentrations of 350 to 1,750 ppm.[6]

7.2.3 Environmental Impacts

In aqueous systems, chromium exists mainly in two oxidation states, Cr III and Cr VI. The hexavalent form is soluble, existing in solution as a complex anion, and it is not sorbed to any significant degree. Trivalent chromium is the most stable form under conditions normally found in natural waters and sediments and it forms insoluble hydroxides or oxides and quickly precipitates in waters with pH greater than 5. Cr III is also relatively insoluble in a saltwater system such as the Baltimore Harbor.

Both the Allied intake and outfall 001 aqueous samples revealed notable concentrations of chromium. The intake, which is drawn directly from Baltimore Harbor, revealed 371 ug/l chromium. NPDES outfall 001 revealed 530 ug/l chromium. As no samples from the harbor are available, it may be reasonable to asssume that the Allied intake provides some indication of harbor water quality with respect to chromium. Due to the relative insolubility of Cr III in saltwater, it is further assumed that the greater proportion of chromium reported in aqueous samples has a valence of 6. Note that direct contact of chromium contaminated wastes on the Allied site with subsurface waters has resulted in documented contamination of these subsurface waters as well as Baltimore Harbor with chromium.

Chromium VI is reportedly acutely toxic to 20 saltwater fish and invertebrate species at concentrations ranging from 2,000 ug/l (polychaete worm and mysid shrimp) to 105,000 ug/l (mud snail).[5] These concentrations significantly exceed the chromium concentrations reported in both the Allied intake and outfall.

Chromium VI can be chronically toxic to species such as polychaete annelids and mysid shrimp at concentrations as low as 25 and 132 ug/l, respectively.[5] Based on these acute and chronic values, an Ambient Water Quality Criterion (AWQC) for the protection of freshwater aquatic life of 18 ug/l has been set for for hexavalent chromium as a 24 hour average. Note that both the Allied intake and outfall 001 substantially exceed this recommended value. It should be noted that a revised AWQC of 54 ug/l has been proposed for hexavalent chromium in saltwater.

Chromium also has the potential to bioaccumulate as limited studies have revealed bioconcentration factors for hexavalent chromium in saltwater of 125 to 200 for bivalves and polychaetes.[5]

7.2.4 Other Contaminants

Lead was reported at concentrations of 21 and 60 mg/kg in the Allied slip and slip embankment samples, respectively, exceeding levels that are generally reported in nonpolluted soils of 15 mg/kg.[7] It may be noted that elevated lead levels are not unusual in urban areas as a result of automobile exhaust and paint deposits from demolished buildings.

Low levels of toxic and potentially carcinogenic compounds, PCB 1248 and 1260, were also reported in slip and slip embankment samples. PCB 1248 was reported at a concentration of 160 ug/kg in the slip soil sample; PCB 1260 was reported at a concentration of 320 and 20 ug/kg in the slip and slip embankment samples, respectively. The reported concentrations of PCBs are not a matter of imminent concern in this case, as PCBs adsorb strongly to soil elements and do not leach readily. Current sample results do not indicate any PCBs in any surface water samples.

Kenneth S. Symms (for)
Elizabeth Quinn, Toxicologist

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